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Lymphoid Hypertrophy in the
Pharyngeal Vault.

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LYMPHOID HYPERTROPHY IN THE PHARYNGEAL VAULT.

It is seventeen years since Meyer, of Copenhagen, first wrote his paper on adenoid growths in the naso-pharynx. Since then the importance of the subject has grown constantly more apparent in explaining not only a set of symptoms directly dependent upon their presence, but in the understanding of a series of sequelæ and of subsequent local changes. Since then also there has been such an abundance of papers more or less complete that there is little left to be said except in a discussion of details.

The subject is, however, of such importance that some points in regard to it bear repetition. One of these, which has not been dwelt on so much in this country as abroad, is the pathological anatomy and the ultimate change of the lymphoid tissue. There are few who have had the opportunity of examining the post mortem appearances of either the healthy or the diseased naso-pharynx. The mutilation necessary to expose the cavity is a barrier to such investigations in the great majority of cases.

The vault of the normal naso-pharynx in the infant is a comparatively smooth walled cavity. There are described and usually found four folds or slight elevations of mucous membrane running longitudinally or obliquely of varying length and size. They are known as the lateral and median folds of the pharyngeal or third tonsil. Between these folds are slight depressions which have been called the lateral and the median re-

inflamed appearance. They are friable and bleed freely. The feeling imparted to the finger has been likened not very accurately, and certainly not very elegantly, to that of a mass of angle worms.

Pathogenic bacteria, streptococci and staphylococci flourish in the perverted and abundant secretions of the parts, and stand ready with the proper preparation of the tissues from "colds," to set up otitis media, lacunar and suppurative tonsillitis.

Hardened in alcohol, sections of this mass, stained double present a very characteristic appearance. Near the surface it is almost exclusively made up of the fine reticulum with cells more densely crowded together in some places than in others.

In the rather thick section which I have here, four or five of these lymph nodes can be seen arranged near together close under the epithelium which is here, as it is normally, composed of cylindrical ciliated cells. As the sections are made nearer to the base of the growth the fibrous trabeculæ become more abundant and in it here and there are numerous mucous glands and blood vessels. This appearance is to be seen in the larger sections. Numerous tiny loops of blood vessels dip down toward the apices of the mass, but none of any size are met with. Hence the hæmorrhage during operation though profuse at first is soon checked, the structure having but a small amount of fibrous tissue to hold the vessels open.

The lymphoid hypertrophy therefore of the pharyngeal tonsil is of the same nature as that of the faucial tonsils, the latter however having larger trabeculæ and more fibrous tissue.

Like the tonsils and like the lymphoid tissues elsewhere, as in the intestines atrophy begins in adult life, and as age advances we have less and

less of it. When middle life is reached we have little or nothing left of previously enlarged pharyngeal and faucial tonsils but the fibrous tissue of the trabeculæ. It is probable that even this diminishes in bulk.

If in these hypertrophies we had nothing enlarged but the lymphoid elements, this absorption as age advances would leave us practically a normal pharynx; but as a matter of fact the fibroid or cicatricial tissue is left behind and interferes with the function of the mucous membrane. The mucous glands instead of pouring out the normal fluid mucus, become clogged with a semi-fluid tenacious secretion which clings to the surface, forming thick crusts by the evaporation of its scanty watery part before it can flow down the sides of the pharynx and be absorbed. This tenacious secretion acts as a constant source of irritation to the parts rendered still more susceptible to inflammation by the cicatricial tissue.

I have seen some cases in which this fibroid tissue was so abundant that it seemed to have formed a sort of false roof to the naso-pharynx connected to the true vault by loose and scanty connective tissue threads. By firm pressure with a stiff probe or with a red hot platinum point or with the end of the finger perforations can be made in it. Many of the post nasal cysts are doubtless of this character, the cicatricial tissue shutting off spaces which including a few mucous glands become filled with a glairy viscid, or a serous fluid. Bands and knots of cicatricial tissue analogous to that in burns of the neck, though of course on a much smaller scale, can occasionally be seen stretching across, and dotted about on various places of the pharyngeal vault. This I believe to be the history and course of these hypertrophies if left to themselves. While in by far the larger number of cases these growths undergo the absorptive changes mentioned between

the ages of fifteen and twenty-five, they are occasionally met with after that age.

Chatellier³ refers to a case in which he operated at forty-nine years of age. Delavan⁴ asserts that lymphoid hypertrophy may begin in adult life. This I doubt very much indeed. It is probable that these are cases in which the tissue has previously existed without noticeable discomfort until some coryza or acute infectious disorder has set up the train of well known symptoms. Dr. J. Solis-Cohen⁵ reports having seen an enlarged pharyngeal tonsil in a woman of seventy, which had never given rise to any symptoms. While I have frequently operated on pharyngeal "adenoids," between the ages of twenty and thirty, I have no recollection of ever having seen a case in which there was much lymphoid hypertrophy in the vault after this age.

It has been stated that these cases are occasionally congenital, and I have observed the growths in an infant a few months old.

They most frequently give rise to symptoms, between the ages of five and ten years. After that age the naso-pharynx begins to enlarge and grow away from the obstructing mass, on all sides, which of itself grows smaller.

As for the frequency of their occurrence, Meyer, out of 2,000 children, found them about one per cent, in Copenhagen. Here in New York, out of 2,000 children, Chappel⁶ found sixty who suffered from adenoid growths, or 3 per cent. These figures were taken from various public institutions, and doubtless the proportion is not so great when we include the better classes.

It has been stated and many times repeated by the best observers, that these growths are the frequent cause of high arched palates, narrow jaws and crooked nasal septa. While they may have

³ *Maladies du pharynx nasal, des tumeurs adenoids*, 1890.

⁴ *N. Y. Medical Journal*, Oct. 12, 1887, p. 393.

⁵ *Journal of Laryngology and Rhinology*, Feb. 1889, p. 3

some slight influence in modifying the growth and development of the maxillary bones, I believe that in this respect they have mistaken the cause for the effect. Heredity is claimed by many as a predisposing cause. If we inherit naso-pharyngeal tumors, or hypertrophies from our progenitors, it is an anomaly and contrary to all conceptions of modern biological laws. We may inherit cells which are predisposed to proliferate, or cells which are of low degree of vitality, but we do not inherit tumors.

We know that there is an inherited tendency for the physiognomy of the child to resemble that of the parent in a general way. This means that the dimensions and shape of the bones of the skull tend to assume the ancestral type. We often see a peculiarly bent little finger running through several members of the family. We know that the negro race has broad cheek bones and low palates, and usually straight nasal septa, in contra-distinction to the prognathous type so frequent in the descendants of the old Iberians.

It is however, an undeniable fact, that lymphoid hypertrophy of the pharyngeal vault, is very much more common in the latter class. To my mind the explanation is tolerably clear. It is easier to get dust out of an obtuse angled corner, than out of an acute angled one, and applied to the pharyngeal vault (which is of course always narrow where the palate arch is) secretions are more apt to lodge in the narrow, high arches, than in the wide, low ones—and adherent secretions set up irritation. To still further prevent the flow of secretions, we have in these cases the narrow anterior nasal passages which do not permit as good a current of air to reach the post nasal space. The vibrating ciliated epithelium thus has greater obstacles to overcome constantly ; and in coryzas, with the narrowing of the angle from

congestion and swelling of the mucous membrane and with the stoppage of the air current, some, times complete, through the anterior passages, the disadvantages of the narrow angles are at once apparent. This should give us a practical hint for treatment of the third stage of a coryza.

Irritation of the pharyngeal mucous membrane is, I believe, the immediate cause of this lymphoid hypertrophy. If we add to a high, narrow vault, as a local predisposing cause a constitution of low cellular vitality—the scrofulous diathesis of a former decade, with a tendency to enlargement of the lymphatic glandular structures everywhere, we have an ample explanation why these cases are more prone to so called adenoid vegetations.

On the other hand these phenomena, narrow vaults, poor constitutions and pharyngeal lymphoid hypertrophy do not always go hand in hand. In blooming, healthy, robust children, narrow pharyngeal vaults may give rise to vegetations, while even with wide vaults, scrofulous children frequently have them. They are rarely seen in robust children with low vaults.

The etiology of every disease is always more or less complex and post nasal hypertrophy is no exception.

The conditions of life under which we live, especially in cities, are very favorable to the frequent occurrence of coryzas and general inflammations of the upper air tract. Our absurdly heated houses put our constitutions to the severest tests. The halls as well as the living rooms are seldom below 75° F. In winter we step outside the door and the inspired air undergoes a change of 40° in temperature. It strikes a mucous membrane enervated by 12 hours of equable high temperature. The muscular coats of the arterioles, the fibrils of the sensitive and sympathetic nerves are placed in the same predicament

as the heart, lung, leg and arm muscles of the sedentary student who is suddenly called upon to run a race or engage in a wrestling match with an athlete. We know the results in both cases.

Ethnographical research, always interesting, would be especially so to us if investigations could be made as to the condition of the naso-pharynx in the American Indian, and the Central African negro. They have no hot air or steam heating furnaces in their huts, and they do not live in the dust of an American city. The difference in temperature between the warm sun and the cool shade is enough to accustom their vaso-motor nervous systems to more decided changes of temperature.

It is probable that when primeval man tore the flesh from the bones of his prey with his teeth, and the individuals of weak constitution perished in early youth, or early manhood, a properly developed superior maxilla was as necessary for existence as were other physical perfections. Under these conditions we should expect to find a normal naso-pharynx.

It was once asserted that cases of adenoids were confined to the damp, cold localities of the northern seaboard. They are probably much more common in this locality than far inland. They are more common in cities than in the country, one reason being perhaps that the throat specialist flourishes, *par excellence*, in cities. They follow the irritations set up by scarlet fever, diphtheria and measles. In fact anything which will set up persistent or often repeated irritation with the predisposing factors mentioned may be a direct cause.

It must be remembered that these tumors are of slow growth. They have usually existed a long time before the symptoms they cause become sufficiently marked to attract the attention of the child's guardian or of his medical attendant.

The increase in size, which they attain from some acute and severe attack of coryza, from the pharyngeal inflammation of scarlet fever, or of measles, or of diphtheria, may cause it to appear that the condition has not previously existed. It must be a fact that they may exist even in considerable volume without ever giving rise to appreciable symptoms, as Dr. Cohen's case illustrates.

In the various papers on the subject so much has been said of the symptoms and sequelæ that further repetition would be tiresome and superfluous.

If you will observe the small cavity which makes up the naso-pharynx and posterior openings of the nostrils in the specimens from the still-born infants I have shown you, you can appreciate that a small mass of tissue would be capable of causing a good deal of obstruction.

Where the condition is suspected examination should at once be made, but this should only be undertaken in the absence of any unusual pharyngeal or nasal inflammation.

Dr. Delavan (*loc. cit.*) has reported a case in which hypertrophy of the pharyngeal tonsil was very apparent during attacks of coryza and pharyngeal inflammation, while in a state of quiescence the mass sank into comparative insignificance.

I have very frequently observed the same thing with these lymphoid growths. In one case which I had examined by digital exploration and had detected their undoubted presence, I made an appointment for an operation when the child should have recovered from a slight coryza she had at the time of examination. At the time appointed the child was etherized, and on introducing the finger into the naso-pharynx to hook forward the palate and locate the growths, I was astounded to find no trace of them beyond a little

roughened feeling to the pharyngeal vault. The operation was postponed and a lesson learned.

In making an examination, if the examiner is accustomed to the use of the rhinoscopic mirror an attempt should always be made, whatever the age of the child, to use it. In a certain proportion of cases it is absolutely impossible for the most patient and experienced of examiners to succeed with the mirror.

Chatellier, in fifty patients, was able to make a diagnosis in forty-one, the youngest of whom was five and one-half, while in nine, the oldest of whom was $12\frac{1}{2}$ years, digital examination was necessary. As far as my own experience goes, I should think the proportion was about the same, though I am sure, without having any distinct recollection of the fact, that I have succeeded at an earlier age than $5\frac{1}{2}$.

Nevertheless in the child little more than their mere presence can be made out with the mirror. A mass of grayish-red tissue apparently springing from the posterior or lateral walls obstructs further view. When the child is anæsthetized for the operation is time enough to make out the extent and the situation of the growths. Digital examination is extremely uncomfortable for the little patients, and simply because they cannot express their feelings in the flowing and forcible language of the adult American, is no reason for sticking the index finger into the naso-pharynx. I know I am preaching what many of us, myself among the number, do not strictly practice, but in the hurry of a large dispensary clinic the requisite time and care cannot always be taken. The use of cocaine in the examination by mirror of the post-nasal space is of very uncertain effect. Occasionally it works like a charm, but more frequently it either has no effect at all in overcoming the reflex spasm, or, as often happens, it aggravates the irritable condition very much,

sometimes producing intense retching and gagging, and renders the patients half frantic in their effort to get rid of the feeling of a foreign body in the throat which it produces. In the adult, posterior rhinoscopy, I believe, is nearly always possible to those accustomed to the use of the mirror.

Various forms of palate hooks have been invented. While some claim to be able to derive advantage from their use in examination, there are many who think them useless. In very tolerant patients who bear cocaine in their throats well, I have found the self-retaining one invented by White, of Richmond, of advantage in operating in the post-nasal space with the galvano cautery. For simple examinations they are superfluous, and it has been my experience that they are worse than useless in irritable throats, often causing uncontrollable gagging and vomiting.

In dealing with the question of operation it is necessary to divide the cases into two classes: those in whom general anæsthesia is necessary, and those in whom simple cocainization is sufficient.

Practically, nearly all those of 12 years of age or under fall in the first class, while etherization is rarely if ever necessary after 15. Between these limits it depends on the patient's individual characteristics. A child will often allow easily enough the first introduction of the forceps, but rebels at all subsequent attempts, and unless one is sure of success it is best to use general anæsthesia at once—as without it many sittings are often necessary and children do not bear these well.

Moreover, in children the naso-pharynx is so small, that little is usually to be gained by the intermittent use of the mirror, while in the adult

pharynx the view obtained is of the greatest importance.

If adenoid growths are accidentally discovered in a child's naso-pharynx, which give rise to no symptoms, it is best not to disturb them. They will nearly always be small in amount, and after atrophy in adolescence will probably leave behind no more cicatricial tissue than the operation itself would occasion. The child's guardian should be warned of their presence, and should any of the well-known symptoms of mouth-breathing, snoring at night, earache or deafness begin to appear surgical interference should at once be undertaken. The operation is a trifling one, the relief is nearly absolutely certain, and if left to themselves the sequelæ may be serious if not disastrous.

Nearly every operator has a method of his own when it is necessary to use an anæsthetic. Many use chloroform which is said to be less dangerous in children than in adults. Most operators produce complete anæsthesia. I believe this to be a mistake. There is always an early stage, that of primary anæsthesia, when pain and the reflexes are abolished for a few minutes, which is long enough to hook forward the soft palate with the finger, and with the post-nasal forceps thoroughly clear the post-nasal space. There is not then danger of blood and tissue getting into the larynx, the patient recovers more promptly, the bleeding is less, and the reaction slight. Immediately after the first growths have been severed, allowing the head of the patient to fall over the edge of the table will put it in the position of Howard, and allow the blood to pour out of the nostrils. This should only be resorted to for a few moments as the position causes pressure to be exerted on the anterior cervical veins which increases the amount of hæmorrhage. This is nearly always very trifling in itself, but when

the patient is deeply anæsthetized blood flowing into the trachea has occasionally produced very alarming and frequently very annoying results.

Notwithstanding the usually prompt cessation of hæmorrhage, there are several cases on record where the bleeding was excessive. Delavan⁷ (*loc. cit.*) has reported a few cases, and Woakes one or two. After cocaine anæsthesia in which three or four comparatively small pieces were removed from the naso-pharynx of a young lady, I have had very prolonged and profuse hæmorrhage. The patient lost considerably over a quart of blood, and it was finally necessary to introduce an absorbent cotton plug soaked in a solution of the nitrate of iron into the post-nasal space, which was effectual in checking the bleeding. In this case I had at a previous sitting removed a much larger piece without more than the usual amount of hæmorrhage.

Voltolini reported a death from a mass of the growths falling into the glottis, but such an accident with the cutting forceps and with the precautions I have mentioned, can be almost ruled out of the list of possibilities with partial anæsthesia.

I believe that the great majority of operators prefer some form of the post-nasal forceps, first used by Loewenberg and modified into different special patterns by nearly every laryngologist of note. The one devised by Gradle, of Chicago, has the advantage of a larger cutting surface, and thus more of the mass can be removed at the first grasp, which is a great advantage since the field of operation is afterward filled with blood and mucus, the detection and seizure of the remaining fragments much more difficult, even when the instrument is guided by the index finger.

The use of the finger-nail alone, or armed with

⁷ Cartaz (*Arch. de Laryngol.*, etc., June, 1890) reports several others.

a steel scraper, is only effective for small sessile growths, especially on the sides and posterior wall of the pharynx. I have found some of the various forms of curettes useful for this purpose.

It is probable that no operation is so thorough that all vestiges of the growths are removed at any one time. While desirable, this is not imperative, as when the blood supply is once broken up, small remaining fragments atrophy and become insignificant.

In older patients, who readily learn to control their faucial muscles, and their apprehensions, it is preferable, I believe, always to use a 10 per cent. solution of cocaine, which makes the parts insensible and allows the use of the mirror.

As before said, there is the greatest difference in the way patients bear cocaine in their throats. This is true not only in regard to reflex phenomena, but also as to the abolition of pain. Without cocaine, the pain is usually not so severe as to be unbearable; but with such a powerful agent in abolishing it altogether, there is no excuse but the idiosyncrasy of the patient for not using it. Two or three grasps of the forceps is usually all that can be made at one sitting, as the field of view becomes obscured in the post-nasal mirror, by blood. Small shreds and protuberances of tissue may be burned down with the cautery—and here, in tolerant patients, the palate retractor may be of service. A number of sittings, with a week or ten days between them, is frequently necessary before the post-nasal space is freed from the obstruction. A weak, warm carbolized douche may be gently used two or three times a day. For a day or two after an ether operation, the child should be confined to the house, and for several days longer some care should be exercised in preventing him catching cold. There is very little reaction after the operation. Older patients need rarely be confined to the house in good weather.

Occasionally, though very rarely, I have seen a previously quiescent otitis media light up after a post-nasal operation and give some trouble, but this always subsides under proper treatment.

In adult patients, it is a matter of fact which experience, some of it quite chagrining, has impressed upon me, that deafness having its origin in post-nasal trouble and its accompanying Eustachian catarrh, is usually susceptible of only a very moderate degree of improvement, if it has existed any great length of time. The improvement in the local condition of the naso-pharynx nearly always ameliorates the aural trouble. Eustachian catarrh is, however, met with, and not infrequently where the naso-pharynx is comparatively healthy. Sunken drum membranes and ankylosis of the chain of bones are met with, in which there is neither naso-pharyngeal nor Eustachian trouble in activity. These have doubtless existed, and are the cause of the condition, but the subacute inflammation has subsided, leaving behind it more or less cicatricial change in the mucous membranes, which is of little moment. But the mechanical apparatus of the middle ear, more delicate in its structure and more highly specialized in function, has suffered irreparable damage.

Therefore, in adults with post-nasal obstruction and aural symptoms, we must give a guarded prognosis. We must have in mind the possible extent of pathological changes, and that depends, in a large degree, on the time the symptoms of Eustachian deafness have lasted. The results of post-nasal treatment in middle ear troubles are brilliant—so brilliant, in fact, that they have inflamed the imaginations and blinded the eyes of many otologists and rhinologists; but the stubborn facts remain, that a large proportion of these cases are incurable, and many of them susceptible of only a very moderate degree of improvement.

